

JUVENILE AND ADULT LEAFLET PHASES IN *ARALIA SPINOSA* (ARALIACEAE)

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Aralia spinosa L. (Araliaceae) is a shrub or small tree ranging through most of the eastern United States (Fernald, 1950). Its several common names (e.g. Prickly Ash, Hercules'-club) emphasize the commonly prickly condition (not spiny; cf. Radford et al, 1968; nor thorny, cf. Gleason, 1952) of its upper stem and compound leaves. The leaves are generally described as prickly on the petiole and rachis; they are often prickly on the major veins of the ultimate leaflets, also. The species is typically distinguished, in part, in various keys (Fernald, 1950; Correll & Johnston, 1970; Steyermark, 1963) from the similar but herbaceous species *A. racemosa* L. by the presence of prickles on *A. spinosa* and their absence on *A. racemosa*. Some specimens of *A. spinosa*, however, have few or no prickles on the leaves (Tucker, 1976; Smith, 1978). Furthermore, a study of herbarium material at UARK undertaken by the author disclosed a suite of leaflet characteristics that are correlated with the prickle-less condition (Table 1; Figure 1).

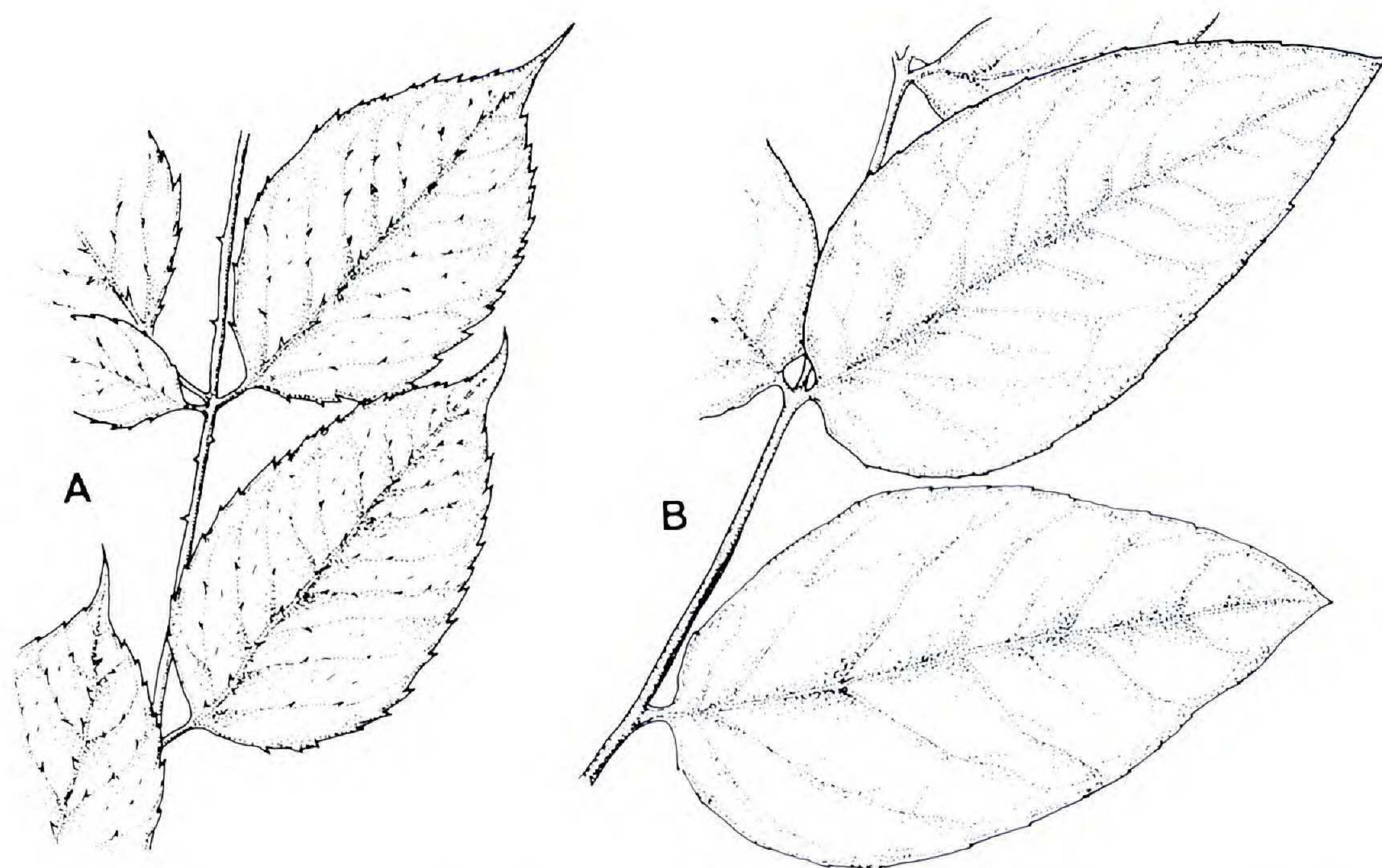
My first impression of this dimorphic condition in *A. spinosa* was that perhaps the prickle-less phase represented a new variety. However, there was no evident correlation between geography or soil type and the prickled or prickle-less phases in Arkansas; the two phases appeared to be randomly scattered through the range of the species.

My second impression was that perhaps the prickle-less phase represented a seasonal or local environmental response of the species. Evidence from repeated collecting through the season of two different populations of the species (kindly performed by Marie P. Locke of Pine Bluff, a volunteer collector for the UARK herbarium) failed to support this second impression. Mrs. Locke sampled at monthly intervals through the 1981 growing season a brightly lit population (edge of woods; *Locke 3026 A-E*, Grant Co.; UARK) and a dimly lit population (deep woods; *Locke 3025 A-E*, Jefferson Co.; UARK) of *A. spinosa* in southern Arkansas. No significant differences were found between the two populations, nor between early-season and late-season material.

Additional study of herbarium materials at UARK and of living material in Franklin County, Arkansas (*Smith 3657 A-C*; UARK) indicated that the suite of leaflet characters (Table 1) is always associated with the blooming and fruiting of *A. spinosa*. The species thus exhibits a juvenile and an

Table 1. Leaflet morphology of the juvenile and adult phases of *A. spinosa*.

LEAFLET CHARACTER	JUVENILE PHASE	ADULT PHASE
Prickles	Several to many on major veins and petiolules.	Few or none.
Teeth	Sharply serrate.	Serrulate to nearly entire.
Shape	Ovate.	Ovate-oblong to elliptical-oblong.
Texture	Thin, drying flat.	Thickish, drying more or less revolute.
Apex	Acuminate.	Acute to short-acuminate.
Base	Rounded to cordate, often oblique.	Slightly rounded to cuneate.

Figure 1. Drawings of the ultimate leaflets of *Aralia spinosa*; A = juvenile phase, B = adult phase; both ca 0.55X.

adult phase, and the prickle-less condition represents the adult phase. The adult phase is exhibited on the leaves at the several nodes below each inflorescence. Both juvenile (on sterile branches) and adult (on fertile branches) phases can occur on the same shrub (cf. *Smith 3657 A-C*). The adult phase was observed on fruiting material from Georgia and Tennessee, which indicates that the phase is characteristic of fruiting material through the range of the species.

English Ivy, *Hedera helix* L., another member of the Araliaceae, has for a number of years been known to be dimorphic, with juvenile and adult leaf phases (cf. Bailey, 1949).

It is significant that *A. spinosa* is most noticeable (when in flower and fruit) at the very time when the leaflets have few or no prickles. It follows naturally from the above that authors of manuals and keys should take into account the dimorphic nature of *A. spinosa* leaflets and design keys to include both the juvenile and adult phases of the species.

A suggested key to distinguish the eastern United States species of *Aralia* follows:

1. Plants acaulescent, the single leaf arising at ground level..... *A. nudicaulis* L.
1. Plants caulescent, with several to many leaves borne on the stem..... 2
 2. Plants herbaceous, typically 0.3–2 (-3) m tall, the stem unarmed or with small bristle-like prickles; leaves monomorphic (all similar in pubescence, cutting, and leaflet shape, though reduced in size toward apex of the stem)..... 3
 3. Umbels few (ca 2–10); stem (and often the leaves) bearing bristle-like prickles..... *A. hispida* Vent.
 3. Umbels numerous in a large panicle; stem and leaves lacking prickles *A. racemosa* L.
 2. Plants woody, typically 3–6 (-10) m tall, the stem armed with large, coarse, broadbased prickles; leaves dimorphic—the *juvenile* phase with many prickles and thin serrate leaflets, the *adult* phase with few or no prickles and thickish serrulate to subentire leaflets *A. spinosa* L.

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